PROC. ENTOMOL. SOC. WASH.
103(2), 2001, pp. 319–324

# TWO NEW SPECIES OF *ZONITIS* F. (COLEOPTERA: MELOIDAE) FROM SOUTHWESTERN NORTH AMERICA, WITH COMMENTS ON GENERIC DEFINITIONS IN THE NEMOGNATHINAE

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*Abstract.*—Two new species of Nemognathinae, ***Zonitis stevewardi*** and ***Zonitis minutissima***, are described from southwestern North America. These species do not easily fit current generic definitions, and they tentatively are placed in *Zonitis* (*Neozonitis*). Problems associated with current generic concepts in the Nemognathinae are discussed.

*Key Words:* Meloidae, Nemognathinae, blister beetles, *Zonitis*

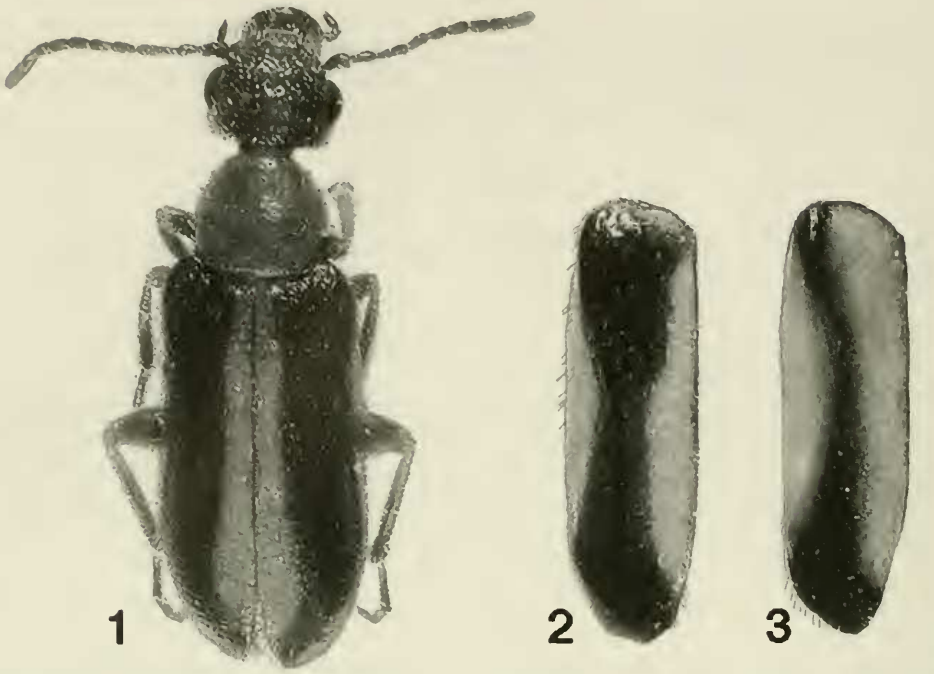
The meloid fauna of the United States is reasonably well known and it no longer is common to encounter taxa not previously recognized at some level. The two closely related species described here both occur in southern Arizona, a popular area for collectors, but they apparently have been missed by most because of small size and low numbers. The few specimens in collections were mixed with *Gnathium* Kirby based on general appearance and size. Although I am confident these species do not belong to *Gnathium* as currently defined, placing them to genus is not straightforward. The genera of Nemognathinae are impossible to define objectively and are in need of thorough revision. Definitions proposed by MacSwain (1951) and followed by Enns (1956) in his revision of several genera of U.S. nemognathines do not entirely accommodate known diversity. The new species, a case in point, do not clearly fit into any described genus, yet because they are characterized by several features assumed to be primitive, a new taxon is not justified. For this paper they are tentatively assigned to *Zonitis* (*Neozonitis*) Enns. The justification for this assignment, as well as a brief discussion of nemognathine generic concepts, follows the descriptions.

Both new species can be separated from all known Nemognathinae by their size (body length < 5 mm) which places them among the smallest of Meloidae, the maxillary galeae which are not produced into a sucking tube (Figs. 4–5), and the fringe of setae on the ventral blade of the tarsal claws (Figs. 6–7). The latter trait, known in all Eleticinae (Pinto and Bologna 1999) and some Old World Meloinae (personal observation) has not been previously reported in the Nemognathinae.

## *Zonitis* (*Neozonitis*) *stevewardi* Pinto, new species

(Figs. 2–4, 6, 8)

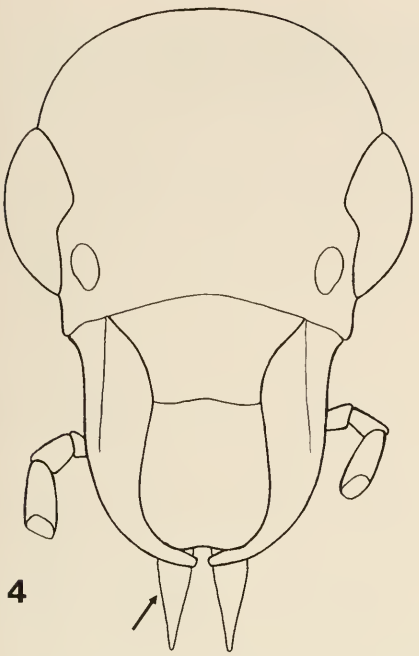
Description.—Body small, relatively slender, surface shiny; length (with head in hypognathous position) = 3.9–4.2 mm. Color primarily fulvous with tibiae, tarsi, antennal segments III–XI, maxillary palpus and mandible darker brown; elytra each with a single longitudinal dark brown vitta (Figs. 2–3), vitta relatively broad, broadest at base and particularly at apex where it occupies entire elytron width, narrowing to

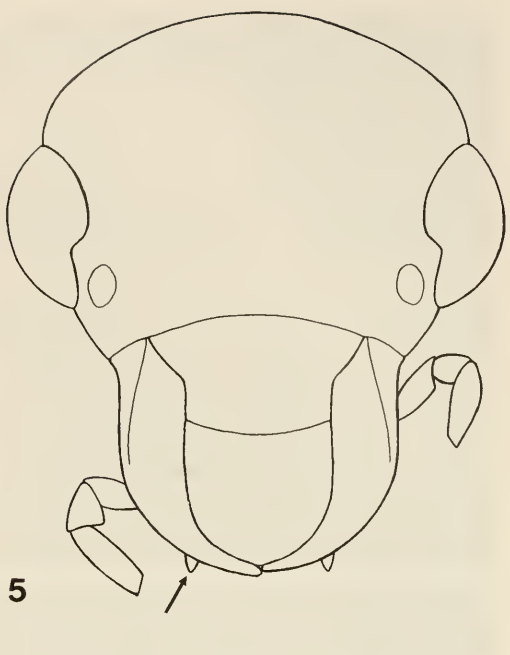



Figs. 1–3. 1, *Zonitis minutissima*, holotype ♀ (23.8×). 2–3, *Z. stevewardi* elytra showing variation in width of vitta (2, from 1 mi. E. Douglas, AZ, paratype ♀ [18.1×]; 3, from 9 mi. SE Picacho, AZ [17.6×]).

slightly less than half width of elytron at middle (but see Variation); eyes black. Pubescence dark, relatively sparse; elytral setae longest, reclinate, ca. 0.1 mm in length, separated from others by a distance subequal to their length; head and pronotum with setae shorter, lighter and sparser; venter with light, sparse, inconspicuous setae. Antenna ca. half as long as body, relatively loosely articulated, with dense procumbent setation and a few short distinctly erect setae; segments elongate, subfiliform, apical segments only slightly wider, with relative lengths of I–XI in an exemplar female as follows: 20:17:24:20:20:19:20:19:19:19:28, proportions similar in male. Head capsule (Fig. 4) 0.74 (0.71–0.79) as long as wide, widest at eyes; interocular distance 0.66 (0.64–0.68) greatest head width; surface with relatively small, moderately dense, inconspicuous punctures, area between dorsum of eyes largely impunctate. Labrum reaching apex of mandibles. Maxillary galeae penicillate, extending well beyond mandibles but not joined to form a sucking tube (Fig. 4). Eyes suboval, slightly emarginate behind antennal fossa, relatively small and not extending beyond mandibles on underside of head. Pronotum slightly longer than wide (length to width ratio = 1.10 [1.07–1.14]); widest at apical $\frac{3}{5}$, sides very slightly convergent to base and moderately convergent to apex; surface shiny, sparsely, shallowly punctate. Elytra smooth, shiny, shallowly and inconspicuously punctate. Tarsal claws (Fig. 6) with 7 elongate teeth in inner row; ventral blade of claws distinctly fringed. Fore- and mid-tibial spurs spiniform; hind tibial spurs (Fig. 8) moderately spathulate, similar in shape, uniformly dark reddish brown in color. Aedeagus of male genitalia with two small sclerotized lobes associated with median tube.

Etymology.—I take pleasure in naming this species after Steve Ward, of Port Angeles, Washington, in recognition of his help collecting Meloidae over the past 35




Figs. 4–5. Head capsule of *Zonitis* spp. 4, *Z. stevewardi*. 5, *Z. minutissima*. Arrow indicates maxillary galea.

years and his enjoyable company on several field trips in southern California and Baja California.

Types.—Holotype ♂. UNITED STATES. *Arizona:* Douglas, 1 mi. E (Cochise Co.); viii-31-1971; on *Tidestromia lanuginosa* (Nutt.); John D. Pinto. Allotype ♀ and two paratypes (1 ♂, 1 ♀); same data as holotype. Holotype and allotype deposited in the California Academy of Sciences, San Francisco (CAS). Paratypes reside in the Department of Entomology Research Museum, University of California, Riverside (UCRC).

Additional material examined.—UNITED STATES. *Arizona:* McNeal, 8 mi. S (Cochise Co.); viii-10-1976; sweeping *Tidestromia lanuginosa*; 1 ♀; John D. Pinto. Picacho, 9 mi. SE (Pinal Co.); viii-25-1976; on *Tidestromia lanuginosa*; 1 ♂; John D. Pinto.

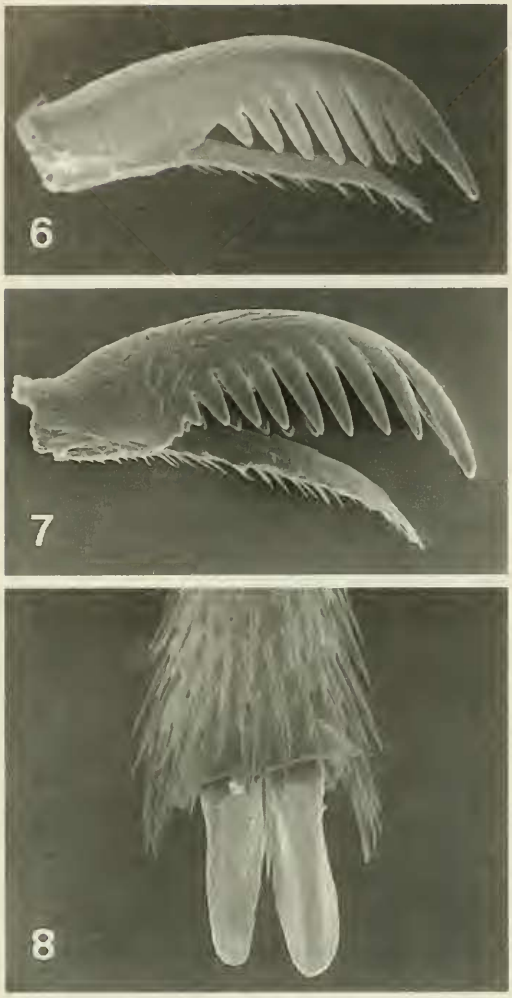
Variation.—The elytral vitta varies in width. In most specimens it is widest apically and basally and narrows only slightly in between where it occupies ca. half the elytral width (Fig. 2). In the specimen from SE of Picacho, however, the vitta is considerably narrower. It is of normal width apically but narrows anteriorly to less than $\frac{1}{5}$ the width of the elytron, and is not widened at the elytral base (Fig. 3).

Diagnosis.—The only species *Z. stevewardi* can be confused with is *Z. minutissima,* described below. Their separation is treated in the description of the latter.

Remarks.—All collections of this species are from *Tidestromia lanuginosa* (Amaranthaceae). However, feeding has never been observed; the few specimens taken were collected by lightly sweeping the plant with an aerial net. It is not clear if *Z. stevewardi* is extremely uncommon or simply difficult to collect. Several attempts to find additional specimens were unsuccessful. *Tidestromia lanuginosa* is relatively common in the Southwest but because of its prostrate growth form it is a difficult plant to sample.

### *Zonitis minutissima* Pinto, new species
(Figs. 1, 5, 7)

Description.—Differing from *Z. stevewardi* as follows: Body length perhaps av-




Figs. 6–8. Scanning electron micrographs of *Zonitis* spp. 6, Hind tarsal claw, *Z. stevewardi* (inner view of posterior claw with ventral blade below). 7, Hind tarsal claw, *Z. minutissima* (as in 6). 8, Hind tibial spurs, *Z. stevewardi*.

eraging smaller, length (with head in hypognathous position) = 3.0–4.1 mm. Color darker with legs and venter of metathorax brown, head brown except fulvous at frons; elytral vitta (Fig. 1) considerably broader, encompassing most of disk (0.6–0.7 elytral width at middle) except for a fulvous margin along suture extending to apical $^{9}/_{10}$ of elytra and a narrow lateral border extending to apical $^{4}/_{5}$, extreme apex of elytra entirely dark brown. Pubescence denser, that on elytra of similar length but setae separated from one another by a distance equal to ca. ½–¾ their length; light colored pubescence on venter moderately dense, conspicuous. Head capsule (Fig. 5) wider, 0.64 (0.61–0.69) as long as wide; galea penicillate but considerably shorter, extending only to apex of mandibles (Fig. 5). Eyes slightly more bulged. Pronotum wider than long (length to width ratio = 0.93 [0.90–0.95]). Elytral surface distinctly rugulopunctate, dull. Tarsal claws (Fig. 7) with 7 elongate and 1 very short teeth in inner row, teeth slightly longer. Aedeagus of male genitalia with ventral lobes associated with median tube somewhat larger, pointed apically.

Etymology.—The specific name refers to the extremely small size of this species.

Types.—Holotype ♀. UNITED STATES. *Arizona:* Picacho Pass (Pinal Co.); viii-7-1940; on *Boerhaavia* (Nyctaginaceae); P. Timberlake; deposited in CAS. Paratype ♀, as above except collected on different plant (label illegible) (UCRC).

Additional material examined.—MEXICO. *Baja California Sur:* Loreto, 33.8 mi. NNW; at light; 1 ♂; F. Andrews and D. Faulkner; in the collection of the California Department of Food and Agriculture, Sacramento.

Diagnosis.—*Zonitis minutissima* is most similar to *Z. stevewardi*. The two are easily separated by the structure of the galea, the dimensions of the head and pronotum, and color. In *Z. minutissima* the galeae of the maxillae are short and extend only to near the apex of the mandibles; in *Z. stevewardi* the galeae are distinctly penicillate and elongate, extending well beyond the mandibles (*cf.* Figs. 4–5). In *Z. minutissima* both the head and pronotum are broader than in *Z. stevewardi* (Figs. 4–5; also see quantitative data above). Finally, color pattern, particularly of the elytra, differs in the two species. *Zonitis minutissima* is darker than *Z. stevewardi* and its elytral vitta is considerably broader (*cf.* Figs. 1–3). Both species can be separated from all other *Neozonitis* by their minute size (body length < 5 mm), and the fringed ventral blade of the

tarsal claws (Figs. 6–7). The only species of *Neozonitis* with a similar color pattern is *Z. bilineata* Say. In addition to size and claw structure, *Z. bilineata* is separated by its moderately inflated tempora, a typical trait of most North American *Zonitis* Fabricius, which represent the widest aspect of the head. In the new species, the head is widest at the eyes and the tempora are not inflated.

Because of size and general shape, *Z. stevewardi* and *Z. minutissima* are most likely to be confused with *Gnathium.* Unlike *Gnathium,* however, the galeae are not prolonged into a sucking tube, and the labrum reaches the apex of the mandibles rather than only approaching their midpoint. Also, the ventral blade of the tarsal claws in *Gnathium* lack fringe setae, a feature absent in all other nemognathines as well. Although, as in *Gnathium,* the antennae are slightly widened apically, they are less distinctly so. Also, the entire antenna is longer in the new species and the segments are more loosely articulated.

The two new species cannot be easily identified to genus using the recent key to New World meloid genera (Pinto and Bologna 1999). This is due to the presence of the fringed ventral blade of the tarsal claws. Until discovered in these nemognathines, the only New World blister beetles known with this feature were genera of the primitive subfamily Eleticinae, a group not found in North America. This character, along with others distinctive of eleticines, is used in the first couplet of the generic key. Consequently, the new species fit neither choice offered by couplet 1. However, the combination of the fringed ventral blade and combed claws, a characteristic of virtually all Nemognathinae, immediately identifies them.

Remarks.—*Zonitis minutissima* appears to be sympatric with *Z. stevewardi.* Both have been collected in August at or near Picacho Pass in Pinal Co. Arizona, although in different years. The females of *Z. minutissima* from Arizona are very similar to the single male collected in Baja California Sur.

## Discussion

As indicated earlier, the generic assignment of *Z. stevewardi* and *Z. minutissima* is questionable. MacSwain (1951) placed *Zonitis* and *Gnathium* in the Zonitini and separated them from *Nemognatha* Illiger, *Tricrania* LeConte and *Hornia* Riley (Nemognathini) by the structure of the aedeagus. *Rhyphonemognatha* Enns was later added to the Nemognathini by Enns (1956). The Zonitini were characterized by the bilobed, and heavily sclerotized median tube. The Nemognathini included genera with a membranous median tube. Unfortunately the distinction drawn by MacSwain is not clear-cut and in certain species of *Nemognatha* a relatively small but distinctly sclerotized bilobed structure also occurs. For example, this is the case in species which Enns (1956) treated as *Nemognatha* (*Pronemognatha*) Enns. The two new species also fit this category. The bilobed structures are not as well developed as in most North American *Zonitis* but they are present. The other character which leads me to place them in *Zonitis* is hind tibial spur structure. In these species, as in most North American *Zonitis,* the spurs are similar in shape, spathulate and completely dark reddish brown in color (Fig. 8). The hind tibial spurs of most other nemognathine genera in North America are structured differently (see Enns 1956). The one obvious exception is *Pronemognatha,* which as indicated by aedeagal structure as well, may be inappropriately placed in *Nemognatha.* The genera of Nemognathinae require considerable study. The generic definitions by MacSwain (1951) and Enns (1956) were based on a limited sampling of North American species and no attempt has been made to apply them to all of our species or to the considerable nemognathine fauna occurring elsewhere in the world.

Within *Zonitis,* the new species are placed in the subgenus *Neozonitis.* Most of their features are consistent with this as-

signment. *Neozonitis* is separated from *Parazonitis* Enns, the only other subgenus recognized in North America, by galea structure. In *Neozonitis* the galeae are scarcely modified and not produced into a sucking tube as they are in *Parazonitis* (Enns 1956). Considering that this clearly is a primitive character, the monophyly of *Neozonitis* has yet to be demonstrated. Also, its relationship to Old World *Zonitis,* most of which similarly lack a sucking tube, requires clarification.

## Acknowledgments

This study was supported in part by a grant from the National Science Foundation (DEB-9508735). Figures 4 and 5 were prepared by Marina Planoutene; Gary Platner was primarily responsible for the preparation of all others.

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